Fort Nelson, AAC Rationale

Fort Nelson Timber Supply Area Rationale for AAC determination

BRITISH COLUMBIA MINISTRY OF FORESTS

Determination of allowable annual cut (AAC) for Fort Nelson Timber Supply Area

Rationale for AAC determination

made on February 7, 1994

John R. Cuthbert

Chief Forester
Date:_____

Fort Nelson Timber Supply Area Rationale for (AAC) Determination

B.C. Ministry of Forests

Fort Nelson, AAC Rationale

Table of Contents

- Fort Nelson Timber Supply Area Rationale for AAC determination
- Introduction
- AAC Determination
- Information Sources for the AAC Decision
- Rationale for Decision
  - Factors required to be considered:
- Implementation of Decision
- Technical Limitations of the Information Used

Fort Nelson, AAC Rationale

106-04841/

◄ TOC ►

Introduction

A review of timber supplies in the Forest Nelson Timber Supply Area (TSA) has been completed under the auspices of the Timber Supply Review. The present AAC for the Fort Nelson TSA is 972,000 m3 per year. It was last determined on July 26, 1989, effective January 1, 1989. The current apportionment of the AAC includes 22,000m3 to be harvested from deciduous stands, 77,000m3, under an aspen tenure, and 145,000 m3 under a cottonwood (balsam poplar) tenure. Because the only tenure specifying cottonwood was reduced from 145,000 m3 to 60,000 m3, 85,000 m3 is currently unallocated. The balance of 750,000 m3 is apportioned under tenures which do not specify the species to be harvested, but the majority of this volume is currently harvested from leading spruce stands.

The 1989 AAC was based on expected utilization standards which did not anticipate commercial use of aspen except for a minor quantity in the manufacture of chopsticks.

Specifically,

- The AAC apportionment of 750,000 m^3, which is currently harvested from coniferous stands, considers only coniferous species. Deciduous species which occur within leading coniferous stands were not considered utilizable and are not accounted for.

- As part of the deciduous apportionment, there is a 77,000 m^3, forest licence to harvest aspen for chopstick manufacture. It assumes that only aspen of suitable quality for chopstick manufacture will be utilized from each stand harvested. The remainder is left as residue which is not considered to be part of the AAC.

◄ ▲ TOC ►

Fort Nelson, AAC Rationale

◄ TOC ►

AAC Determination

The AAC for the Fort Nelson TSA will be 1,500,000m^3 per year effective for the five-year period January 1, 1995 to December 31, 1999 - or to an earlier date if it becomes necessary to review the AAC decision for any reason prior to December 31, 1999.

The AAC is partitioned, according to provisions of Section 7 (1.3)(a) of the *Forest Act,* into 600,000 m^3 from forest stands in which coniferous species predominate (herein termed "leading coniferous stands") and 900,000 m^3 from forest stands in which deciduous species predominate (herein termed "leading deciduous stands").

The stated AAC volumes in each partition are predicted on achieving specified utilization standards for all species (both coniferous and deciduous) from each area harvested (see page 6).

◄ ▲ TOC ►

Fort Nelson, AAC Rationale

Information Sources for the AAC Decision

Information provided to me for purposes of determining an AAC for the Fort Nelson TSA includes:

- A report entitled Fort Nelson Timber Supply Area Timber Supply Analysis Report, Prince George Forest Region Planning and Inventory Section, June 1992.

- A report entitled Fort Nelson Timber Supply Area Timber Supply Analysis Report - Aspen Resource, Prince George Forest Region, Planning Section, July 1993.

- A report entitled Socio-Economic Evaluation of Fort Nelson TSA Timber Harvest Scenarios, BC Ministry of Forests, May 1993.

The first two reports present projections of timber supplies into the future, but also identify numerous technical limitations that must be considered in interpreting these results. The determination of an AAC, therefore, involves informed judgment. Once an AAC has been determined which reflects appropriate assessment of all factors required to be considered, there is no additional precision to be gained by carrying out a specific computer model run at the exact AAC determined.

Staff from the Resource Planning Branch, the Prince George Forest Region and the Fort Nelson Forest District provided additional technical explanations with respect to the content of these reports. They also answered specific questions that I posed relative to factors which I must consider under Section 7 of the *Forest Act*.

Fort Nelson, AAC Rationale

Rationale for Decision

Fort Nelson, AAC Rationale

◄ TOC ►

Factors required to be considered:

Section 7 of the *Forest Act* prescribes conditions which the Chief Forester must meet when determining AACs. Section 7 (revised 1992) is appended in its entirety as Appendix I. Section 7(3) lists factors which the Chief Forester must consider in making an AAC determination. An explanation of how each of those factors was considered in my determination is provided below

Section 7 (3)

In determining an allowable annual cut under this section the chief forester, despite anything to the contrary in an agreement listed in section 10, shall consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area

The forests of the Fort Nelson TSA comprise numerous types of stands which differ in species composition, quality of timber, availability under integrated resource management planning, and cost of harvesting. The forest industry is currently only using a portion of this supply profile. The timber supply analysis projected the harvest level implications of continuing with current practices, as well the implications of expanding the range of types being harvested.

The forest inventory of the Fort Nelson TSA was stratified by stand type into three components for analytical purposes: leading coniferous, leading aspen, and leading cottonwood. These results provided a basis for partitioning the AAC.

The growth and yield information that was used in the models represents the best available data for the TSA and I am satisfied that it provides a sufficient basis for the purposes of my AAC determination. I am aware of potential inaccuracies in this information, particularly with respect to misclassification of the growth potential of some aspen stands. Staff have advised me that reclassification will result in increased estimates of growth on these sites. I have noted that this factor would cause modeling results to

underestimate long-term yields from aspen stands.

(ii) the expected time that it will take the forest to become re-established on the area following denudation;

Timber supply projections have been based on achievement of rapid reforestation to fully stocked. freely growing stands as required under the *Forest Act*. A regeneration delay of

four to six years was assumed for the coniferous analysis, depending upon the forest types involved. The actual regeneration delay achieved by the industry over the past decade has been much longer than that. as reported to me by the District Manager. There has been improvement over the past three years, but the average regeneration delay is still two to three years longer than assumed in the analysis. The timber supply analysis for leading coniferous stands therefore overstates the long-term timber supply attainable from the TSA under current practices.

For leading deciduous stands, it is my expectation that reforestation can be achieved within acceptable regeneration delay standards through natural reforestation. The District Manager has advised me that difficulties may be encountered in maintaining components of coniferous species which are represented in original stands, and that additional silvicultural activities may be required to ensure that these species are reestablished within an acceptable timeframe.

In my AAC determination, I have assumed that management practices will improve sufficiently to meet the legal obligations and the objectives for species representation, and that the regeneration delay periods used in the models will be achieved.

(iii) silvicultural treatments to be applied to the area;

Silvicultural treatments to rehabilitate not satisfactorily restocked (NSR) sites will improve future timber production. Present estimates are that 28,000 ha to 30,000 ha are suitable for treatment. The resulting future increase in production will be about 60,000 m^3 per year. Forest District staff have advised me that this estimate of treatable area is less than previously documented, and is based on information obtained since the timber supply analysis was completed.

In addition to issues around regeneration delay as described for leading spruce stands under (ii), above, there is a concern that the number of seedlings being planted per hectare is insufficient to meet the stocking targets required in preharvest silviculture prescriptions. Staff have advised me that it is their opinion, based on survey results provided by the forest industry, that over half of recently harvested sites will not meet the minimum stocking targets and that, therefore, future yields form these stands have been over-estimated.

There is a further concern that harvesting practices, particularly the use of large clearcut openings, are reducing seed sources for natural reforestation by conifers. Harvesting the better quality stands is removing the most desirable sources of seed and may lead to poorer genetic characteristics in future stands. Large openings also raise the water table on some sites and create further difficulties in achieving successful regeneration.

In my AAC determination, I gave careful consideration to the fact that the *Forest Act* imposes legal obligations on tenure holders to achieve adequate reforestation. I have therefore based my AAC determination on the premise that, although future production from stands already harvested may have been overestimated by the timber supply analysis, all necessary measures will be taken to ensure that required silvicultural performance is achieved from now on.

My decision to set the portion of the AAC partitioned to leading deciduous stands at 900,000 m^3 per year assumes that silvicultural methods will be employed to retain the prevailing mixture of species in the original stands. The District Manager has advised me that he will require tenure holders to make commitments in the preharvest silviculture prescription to meet the above-mentioned silvicultural objective.

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area;

My decision to set the portion of the AAC partitioned to leading coniferous stands at 600,000 m^3 per year assumes that at least 80,000 m^3 will be harvested from stands in which lodgepole pine is the predominant species; that harvests in stands where spruce is the predominant species will use the full available quality and size profile; and that certain deciduous species within these stands will be utilized. Failure to meet these performance criteria will require a reduction in the AAC to a level commensurate with actual performance.

In the coniferous timber supply analysis conducted in 1992, 'current performance' was based on actual utilization and silviculture performance achieved to 1989. Under those conditions, a harvest rate of only 408,000 m^3 would have been achievable in the short-term, falling to 361,000 m^3 after forty years and declining even more over the next two centuries.

Staff have advised me that forest management practices have improved significantly since 1989. They now recommend that the 'basic silviculture' option more closely reflects current performance. Further, continuing to rehabilitate NSR stands and to meet commitments in recent development plans to increase the harvest of pine and lower quality stands means a short-term harvest level of 600,000 m^3 is achievable and the long-term harvest rate will not decline to the predicted level. Significant opportunities exist to offset this potential decline by continuing to improve utilization of the quality and cost profile of stands harvested by the forest industry.

My determination has taken into account information which indicated that by utilizing aspen and cottonwood from leading coniferous stands, there will be about 60,000 m3 per year available which was not accounted for in the timber supply estimates.

The quality of aspen within the TSA and its utilization were major considerations in my AAC determination. Only a portion of the harvest is suitable for chopstick manufacture. This is because of the need for clear, straight-grained wood with few knots, and also because much of the wood is affected by an organism which imparts a stain to the wood. In aspen stands harvested to date by the holder of this license, as little as 20 to 30 percent has been used. In the absence of other demands for the residue, these stands are currently underutilized.

Some aspen is being recovered from coniferous stands and utilized in manufacture of lumber and plywood, but this is a relatively small portion of the total aspen supply.

I am satisfied that the cottonwood harvest projection properly represents the expected utilization of that species. My expectation is that the harvest in leading cottonwood stands will be limited to 60,000 m^3 of the leading deciduous partition of the AAC, in maintaining a sustainable level of production from these stands.

Decay, waste and breakage factors are factored into the analysis as the stated utilization level. I am satisfied that the analysis provides me with information that adequately reflects the results of current management practices.

Interest has been expressed by potential investors in building a manufacturing plant which would utilize all of the current aspen residue, plus aspen from additional harvested areas. I have based my AAC determination on the premise that this facility will be built, and that all aspen will be utilized to the standards defined below. If the actual utilization is less than that, the AAC will be reduced to avoid exceeding the harvest rate I intend to achieve within the TSA.

The expected utilization standards are as follows:

Species	Firmwood standard	Stump height	Diameter at breast height-dbh	Top height diameter - dib
	(%)	(cm)	(cm)	(cm)
Balsam	50	30.0	17.5	10.0
Spruce	50	30.0	17.5	10.0
Pine	50	30.0	12.5	10.0
Aspen	50	30.0	12.5	12.5
Cottonwood	100	30.0	27.5	20.0
Birch	n/a	n/a	n/a	n/a

Notes:

- Utilization standards as per the June 1992 analysis for spruce, pine and cottonwood (balsam poplar). Utilization standards as per the July 1993 analysis for aspen.

- The aspen top height diameter of 12.5 approximates where major branching generally occurs
- Diameter at breast height is measured on the outside of the bark.
- Top height diameter is measured on the inside of the bark.
- Birch excluded from contributing.

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and

Current harvesting practices are planned in a way to maintain habit for wildlife and to avoid altering the stability of watercourses. In the timber supply analysis, allowances for these include reductions to the land base for agriculture, recreation, range and environmentally sensitive areas. Also, the timber supply analysis simulated integrated resource management practices by assuming that timber would be harvested in two "passes" with a delay of twenty years before cutblocks adjacent to first-pass openings could be removed for coniferous species, and twelve years deciduous species.

Staff have advised me that current integrated resource management practices are more restrictive than can be simulated by a two-pass system, and that there is a trend for even more limits on timber harvesting to meet these objectives in the future. The present pattern of large, concentrated cutblocks disrupts traplines and is of particular concern to First nations who have traditionally trapped this area. It is my opinion that meeting new standards for integrated resource management will not affect achievement of the AAC in the short-term, but the long-term harvest projections from the timber supply analysis may be optimistic with regard to this factor.

I have been further advised by staff that the Protected Areas Strategy may ultimately result in preservation of some areas which are now considered to be part of the operable forest landbase. When decisions are made regarding which areas will be given protected status, the implications will be evaluated in a subsequent review of timber supplies.

(vi) any other information that, in his opinion, relates to the capability of the

The network of seismic lines throughout the TSA removes some forest land from production. As these lines must be reopened from time to time, this constitutes a long-term productivity loss. There is debate about the actual amount of the net, or merchantable, forest landbase lost to these exploration activities. The timber supply analysis was based on a 5% loss. An industry study showed a lower level of loss, but the area selected was not representative of the TSA as a whole. For the purposes of my AAC determination, I have assumed a 5% loss.

(b) the short and long-term implications to the Province of alternate rates of timber harvesting from the area;

The harvest schedules predicted by the timber supply analysis portray the short- and long-term implications of different management options. No individual modeling result can be taken as a definitive representation of what timber harvests might be achieved now and in the future, but collectively they enable a picture to be formed of how various assumptions and uncertainties may affect the harvest schedule. My AAC determination is based on my judgment that the following tabulated harvest schedule can realistically be achieved, considering the current knowledge about the forests and harvesting practices in the Fort Nelson TSA.

Harvest Schedule Anticipated by AAC Determination

	Short Term (0-20 Years)	**Long-term (21+ years)**
Leading Coniferous Stands	600,000 m^3	400,000 m^3
Leading Deciduous Stands		

	900,000 m^3	1,100,000 m^3
Total AAC	1,500,000 m^3	1,500,000 m^3

The transition between short- and long-term harvest rates is anticipated to be gradual, spanning up to 4 decades; other factors may avert the need for this transition and may result in an increased future harvest level.

The many uncertainties raised during the analysis regarding future harvesting rates in leading coniferous stands caused me to be cautious in accepting more optimistic projections. I have noted, in particular, that there are large areas of immature pine through the region which have become established following wildfires. These stands do not provide harvesting opportunities now, but may provide an opportunity to maintain the level of coniferous harvests in the future. Because performance in these pine stands has not been proven, and other uncertainties may cause a possible downward trend in future harvests from coniferous stands, I have decided to determine a conservative rate of harvest in deciduous stands; overall, this choice will increase the probability that the combined harvest of deciduous and coniferous stands can be maintained at a consistent or increasing level in the future. This decision will be revisited in subsequent reviews of the AAC.

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities;

The solid wood manufacturing industry produces lumber and plywood primarily from spruce and cottonwood logs. Recently, some aspen has begun to be used as core stock for plywood and for minor amounts of lumber. I am advised that the lumber industry will be able to accept lodgepole pine when harvesting moves into those stands.

An important use of aspen is for the manufacture of chopsticks but only a small portion of the harvest is suitable for that purpose. There is at present no manufacturing capability in place to utilize the residue. The chopstick manufacturing facility could double its output but that would require harvesting even more aspen, the majority of which would not be utilized.

Interest has been expressed by investors who are considering construction of one or more manufacturing facilities that would utilize the residue, plus additional aspen harvest. One of the manufacturing facilities frequently mentioned is an oriented strand-board plant.

It is my opinion that the existing and proposed plant(s) will be capable of utilizing the quantity, species mix and quality of timber available to be harvested under the partitioned AAC that I have determined.

(d) the economic and social objectives of the Crown, as expressed by the minister, for the area, for the general region and for the Province; and

The Minister of Forests has advised me that government's broad social and economic objectives for the management of forest lands, as specified through the objectives and

considerations under Section 4 of the *Ministry of Forests Act* and Section 7 of the *Forest Act*, should be the fundamental basis for my determination. He has further advised me that the five objectives listed below, which were derived from public input on the Timber Supply Review Discussion Paper, are consistent with government's social and economic objectives for the area and that they should be considered as important factors in my AAC determination.

1. long-term community stability must be given priority in forest management decisions, and a desire to avoid future reductions in timber supplies was stressed;

2. economic development should be helped by creating opportunities for viable, sustainable new industry in the TSA, while at the same time maintaining a timber supply for the present forest industry and its employees;

3. timber harvesting must be done in a way that maintains the region's environmental quality and other natural resource values;

4. the forest industry must harvest the species, quality and cost profile of stands in the forest; and

5. forest practices must be improved to address cutblock size, ensure good reforestation performance and to improve use of aspen left after harvesting.

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area

Spruce budworm is becoming an increasing problem in some areas such as Beaver River. Although not yet considered to have serious implications for timber harvests, it may be causing loss of the spruce understorey in some deciduous stands. Spruce bark beetle outbreaks have been noted in localized areas such as in Kotcho Lake and the pest remains a threat throughout much of the region because of the debris left behind by seismic exploration. Spruce weevil has also been identified as a problem in some stands. None of these species has reached epidemic proportions and the losses attributable to them will, to a large degree, have been included in the data used to create growth and yield tables for the area. No other significant infestations were identified during the timber supply review.

Fort Nelson, AAC Rationale

Implementation of Decision

Considering all of the foregoing assures me that an allowable annual cut of 1,500,000 m^3, partitioned into 600,000 m^3 from leading coniferous stands and 900,000 m^3 from leading deciduous stands, will enable sound stewardship of the forests within the Fort Nelson TSA. This harvest rate is compatible with forest practices applied to meet objectives for integrated resource management and environmental protection; it will provide immediate employment and economic benefits to the industry, the community and the province; and it will maintain opportunities for future generations to also benefit from a legacy of well-managed, productive forests.

Under the new AAC, there will be less harvesting in coniferous stands than at present and, as a result, the amount of coniferous species available to the solid wood manufacturing industry from this partition of the AAC will be reduced. However, harvesting aspen stands under the deciduous partition of the AAC will result in some additional coniferous species that will offset the previously mentioned reduction. I expect that the forest industry will develop arrangements to sell or trade logs to ensure that they are processed in the most appropriate facilities.

Selecting an effective date for implementing the new AAC is an important aspect of my determination. Because a facility to process the additional aspen in the AAC has not yet been constructed, there is no market for an increased volume to be harvested. As a result of not increasing the harvest in aspen stands immediately, and thereby not realizing the coniferous component contained within these stands, there could be a short-term shortage of coniferous species for the existing manufacturing industry. I have therefore chosen to delay implementing the new AAC until January 1, 1995.

During the remainder of 1994, the current AAC of 972,000 m^3 will remain in place. This period will allow time to plan and construct a new processing facility and issue new timber harvesting tenures. It will also provide a period of time for current operators to plan their transition to new harvest levels and species profiles.

Fort Nelson, AAC Rationale

Technical Limitations of the Information Used

Inventory, growth, and yield data are subject to statistical uncertainty. Likewise, map projections and computer simulations of timber supply are models, or abstractions of reality. As such, they never reflect reality perfectly and they do not necessarily point at the perfect solution to a problem. They do, however, provide valuable insight into potential impacts of different resource-use assumptions, and are thus important components of the information which I must consider in AAC determinations.

For this reason, timber supply analyses examine the sensitivity of the harvest forecasts produced by the model, to variations in the information and assumptions used in the computer model.

Since it is reasonable to change any of the assumptions within statistical limits of uncertainty, it is impossible to produce one harvest forecast which is more correct than another forecast which is based on different, but equally valid, assumptions.